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(54) Abstract Title
Braille overlay sleeve for mobile telephone keypad

(57) The overlay includes a flexible, resilient sleeve 1 with a closed lower end 8 adapted to fit around a mobile telephone keypad. The sleeve engages with the telephone by means of a projection 21 on the keypad which engages with a recess 22 formed in the sleeve. The overlay has an upper surface and a lower surface and comprises a number of regions 3, such that each region corresponds to a key 7 of the telephone. Each region is provided with a tactually discernible relief pattern 11 on the upper surface, and each pattern is distinguishable by touch from the others. The patterns may be Braille characters, Moon characters (Fig.2b) or standard alphanumeric characters (Fig.2c) formed in raised print. The pattern corresponds to a code or function assigned to the corresponding key of the telephone keypad. Alternatively, the tactile pattern may be formed directly on the keys, and an audible signal is produced upon operation of a key to confirm to a visually impaired user that the correct key has been pressed.

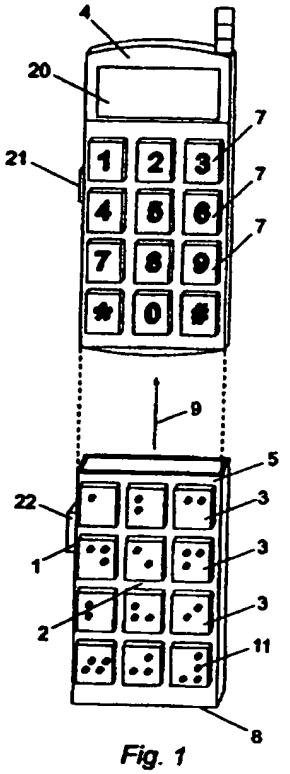

Fig. 1

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

KEYPAD AID FOR THE PARTIALLY SIGHTED

The present invention relates to a keypad device, in particular a keypad device for use by blind or partially sighted people.

The field of telecommunications has been revolutionised in the past ten years with the introduction of the mobile telephone. At the moment, new designs and technological features of mobile telephones are being introduced to the market almost every month. However, despite all these developments there still appears to be one sector which is not being catered for - that of the blind or partially sighted telephone user.

Current designs of mobile telephone provide few provisions for visually impaired customers who rely more on touch than on sight. For example, a standard layout of keys is essential for the visually impaired. At present, mobile telephones lack keys which are tactually discernible and therefore it is virtually impossible for the visually impaired to use such telephones.

Mobile telephones provide the user with more freedom to

communicate and keep in touch while on the move, and would greatly assist the blind and visually impaired when they are not near a conventional telephone. The aim of the present invention is to provide a keypad which will allow use of a mobile telephone by the visually impaired, and in addition could also be used for other goods which utilise a keypad or keyboard.

According to a first aspect of the present invention there is provided an overlay for a keypad comprising a plurality of keys, said overlay having an upper surface and a lower surface and comprising a plurality of regions, each region corresponding to a key of said keypad and being provided with a tactually discernible relief pattern on the upper surface of the overlay region, each of said patterns being distinguishable from each other, whereby each pattern corresponds to a code or function assigned to the key corresponding to the overlay region.

Preferably the overlay is comprised in a substantially tubular sleeve adapted to fit over a telephone handset provided with said keypad. Preferably the tubular sleeve is substantially rectangular in cross section.

Preferably the tubular sleeve is provided with location means adapted to locate with corresponding location means on said telephone handset, such that the sleeve is restrained from sliding longitudinally with respect to the handset.

Preferably the telephone is a mobile or cordless telephone.

Preferably overlay is made from a flexible, resilient material, such as plastic. The material may be semi-

rigid and may be moulded from a single sheet of plastic material.

Preferably the tactually discernible relief patterns are characters of the Braille or Moon writing systems, or they may be raised outlines or embossed representations of the numerical or alphabetical characters themselves, so that a visually impaired user not familiar with Braille or Moon writing systems may still recognise the characters by touch.

Preferably the lower surface of the overlay is provided with a plurality of recesses, each recess corresponding to a respective region, and each recess being adapted to fit over a protruding key of said keypad to positively locate the overlay on the keypad.

According to a second aspect of the invention there is provided a keypad comprising a plurality of keys, at least some of said keys being provided with a tactually discernible relief pattern on the surface thereof, each of said patterns being distinguishable from each other, whereby each pattern corresponds to a code or function assigned to the key.

Preferably the keypad is a telephone keypad, most preferably a mobile telephone keypad.

Preferably the tactually discernible relief patterns are characters of the Braille or Moon writing systems, or they may be raised outlines or embossed representations of the numerical or alphabetical characters themselves, so that a visually impaired user not familiar with Braille or Moon writing systems may still recognise the characters by touch.

According to a third aspect of the invention there is provided a telephone comprising a keypad according to the second aspect, wherein the telephone comprises an audible confirmation signal means which emits an audible signal upon operation of one of the plurality of keys. The signal means may comprise an electronic voice synthesis means, such as a sound synthesis circuit, which emits an audible signal in the form of a word corresponding to the character on the key which is operated. For example, if the key corresponding to the figure 1 is depressed, then the signal means will emit as an audible signal the word "ONE". If a "Clear" key is depressed, then the signal means will emit as an audible signal the word "CLEAR".

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a plan view of a sleeve according to a preferred embodiment when used in conjunction with a mobile telephone; and

Fig. 1a is a side view of the embodiment of Fig. 1 when the sleeve of Fig. 1 is fitted on the telephone;

Fig. 2a shows a first variation of the upper surface of the sleeve of Fig. 1;

Fig. 2b shows a second variation of the upper surface of the sleeve of Fig. 1; and

Fig. 2c shows a third variation of the upper surface of the sleeve of Fig. 1.

A sleeve according to the invention, generally denoted 1, is shown in Fig. 1 of the accompanying drawings. The sleeve is moulded from a flexible plastics material. The sleeve 1 is moulded so that a keypad section 2 is produced, the keypad 2 having a number of keys 3 formed on it, each key 3 having a tactually discernible Braille character 11 formed in relief thereon.

The sleeve 1 is also fitted with a fastening means (not shown) so as to aid the fitting of the sleeve over a mobile telephone 4. This fastening could be provided by a either a hook and loop fastening fabric or a press-stud arrangement, so that the sleeve is opened up, arranged around the telephone and then fastened to form a closed sleeve.

Alternatively the sleeve is formed as a continuous tubular member which is secured to the telephone 4 by sliding in the direction of arrow 9, as shown in Fig. 1. The sleeve 1 is resilient and sufficiently flexible to allow the sleeve to be stretched to fit over the telephone body. The sleeve will usually stop short of the screen or display 20 on the telephone. The sleeve may have a closed lower end 8, so that the user knows when the sleeve is fully pushed home around the telephone body. Alternatively The body of the telephone 4 may be provided with a projection 21 adapted to engage with a corresponding recess in a projecting portion 22 on the sleeve, to ensure proper alignment of the overlay regions or keys 3 of the overlay and the keys 7 of the telephone keypad.

The moulded keypad 2 of the sleeve 1 is moulded in such a way as to replicate the keypad layout of the mobile telephone 4 being converted. The underside of the

front face 5 of the sleeve is provided with a number of depressions 6, each of which corresponds in size, shape and position to one of the keys 7 of the telephone 4. Hence, when the sleeve 1 is securely fitted to the mobile telephone 4, pushing one of the keys 3 on the sleeve 1 will in turn operate the respective key 7 on the mobile telephone 4.

Fig. 2a shows the arrangement of the front face 5 of the sleeve 1. The keys 3 also contain printed characters 8 as well as Braille characters 11, so that the telephone can be used by a sighted person when the sleeve is in place. The keypad 2 of the sleeve 1 could also be moulded so that the tactually discernible characters in relief on the keys 3 are of the Moon writing system, as illustrated in Fig. 2b, or so that the characters are actually representations of the roman numerals or alphabetic characters in relief, as illustrated in Fig. 2c.

The sleeve may be formed of any suitable plastic material, such as polyethylene, pvc, polypropylene or other material.

With the sleeve according to the invention, it would be possible to provide a mobile telephone that not only the sighted could use but also the visually impaired as well. The sleeve can be easily removed and also provides a protective outer cover for the mobile telephone.

Different sleeves could be produced for different models of mobile telephone, as most telephones have additional function keys whose locations differ from one manufacturer or model to the next. Manufacturers could even supply the sleeves as after-market

accessories to visually impaired customers. Mobile telephones could also be provided with an integral speech synthesis chip for audibly confirming the key being pressed by the visually impaired user, by sending a sampled audio signal corresponding to the name of the key to the speaker of the telephone when a key is pressed. This gives feedback to a visually impaired user that the correct key has actually been pressed.

Instead of supplying a separate sleeve, the embossed characters, be they Braille, Moon or raised print Roman numerals, may be formed directly on the keys of the mobile telephone.

Modifications and improvements may be incorporated without departing from the scope of the invention.

CLAIMS

1. An overlay for a keypad comprising a plurality of keys, said overlay having an upper surface and a lower surface and comprising a plurality of regions, each region corresponding to a key of said keypad and being provided with a tactually discernible relief pattern on the upper surface of the overlay region, each of said patterns being distinguishable from each other, whereby each pattern corresponds to a code or function assigned to the key corresponding to the overlay region.

2. An overlay according to Claim 1, wherein the overlay is comprised in a substantially tubular sleeve adapted to fit over a telephone handset provided with said keypad.

3. An overlay according to Claim 2, wherein the tubular sleeve is substantially rectangular in cross section.

4. An overlay according to Claim 2 or 3, wherein the tubular sleeve is provided with location means adapted to locate with corresponding location means on said telephone handset, such that the sleeve is restrained from sliding longitudinally with respect to the handset.

5. An overlay according to one of Claims 2 to 4, wherein the telephone is a mobile or cordless telephone.

6. An overlay according to any preceding Claim wherein said overlay is made from a flexible, resilient material.

7. An overlay according to any preceding Claim wherein said overlay is moulded from a single sheet of plastic material.

8. An overlay according to any preceding Claim wherein said tactually discernible relief patterns are characters of the Braille or Moon writing systems, or are raised relief alpha-numeric characters comprising Roman numerals or print characters.

9. An overlay according to any preceding Claim wherein the lower surface of the overlay is provided with a plurality of recesses, each recess corresponding to a respective region, and each recess being adapted to fit over a protruding key of said keypad to positively locate the overlay on the keypad.

10. A keypad comprising a plurality of keys, at least some of said keys being provided with a tactually discernible relief pattern on the surface thereof, each of said patterns being distinguishable from each other, whereby each pattern corresponds to a code or function assigned to the key.

11. A keypad according to Claim 10, wherein said keypad is a telephone keypad.

12. A keypad according to Claim 10 or 11 wherein said tactually discernible relief patterns are characters of the Braille or Moon writing systems, or are raised relief alpha-numeric characters comprising Roman numerals or print characters.

13. A telephone comprising a keypad according to one of Claims 10 to 12, wherein the telephone comprises an audible confirmation signal means which emits an

audible signal upon operation of one of the plurality of keys.

14. A telephone according to Claim 13 wherein the audible confirmation signal means comprises a speech synthesis system and a control circuit adapted to cause the speech synthesis system to emit a spoken word signal corresponding to the function of the operated key upon operation of one of the plurality of keys.

15. A sleeve for a mobile telephone as hereinbefore described with reference to the accompanying drawings.

The Patent Office

Application No:	GB 9827280.0	**Examiner:**	Gary Williams
Claims searched:	1-15	**Date of search:**	26 January 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): B6F: FCGK

Int Cl (Ed.6): B41J: 3/32,5/10; G06F: 3/02; G09B: 21/00; H04M: 1/00; 1/23

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2308940 A	(SAMSUNG) See Fig.3A, page 7 lines 1-12	10-12
X	GB 2152437 A	(POLATSCHEK) See Fig.2, page 2 lines 60-64	1,6-9
X	GB 2009047 A	(SAFEWAY) See Fig.2, page 1 lines 109-128	10
X	WO 97/07520 A2	(WHEELER) See Figs.3&4, page 10 lines 19-25, page 12 lines 15-19, page 14 lines 6-26	10-14
X	WO 96/27256 A1	(BRIGHT) See Figs.1&4, page 7 lines 3-12, page 10 line 13 - page 11 line 19	1,6-12
X	WO 92/08285 A1	(ADVANCED CELLULAR) See page 12 lines 24-28, page 16 lines 19-28	10-13
X	US 5536170	(MURPHY) See Figs.1&2A&B, col.3 lines 25-64, col.4 lines 35-40	1,6,8,10
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X,P	WPI Abstract Accession No. 98-452946/39 & JP 10190797A (TANAKA) 21.07.98 (see abstract)		1-3,5,6,8

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

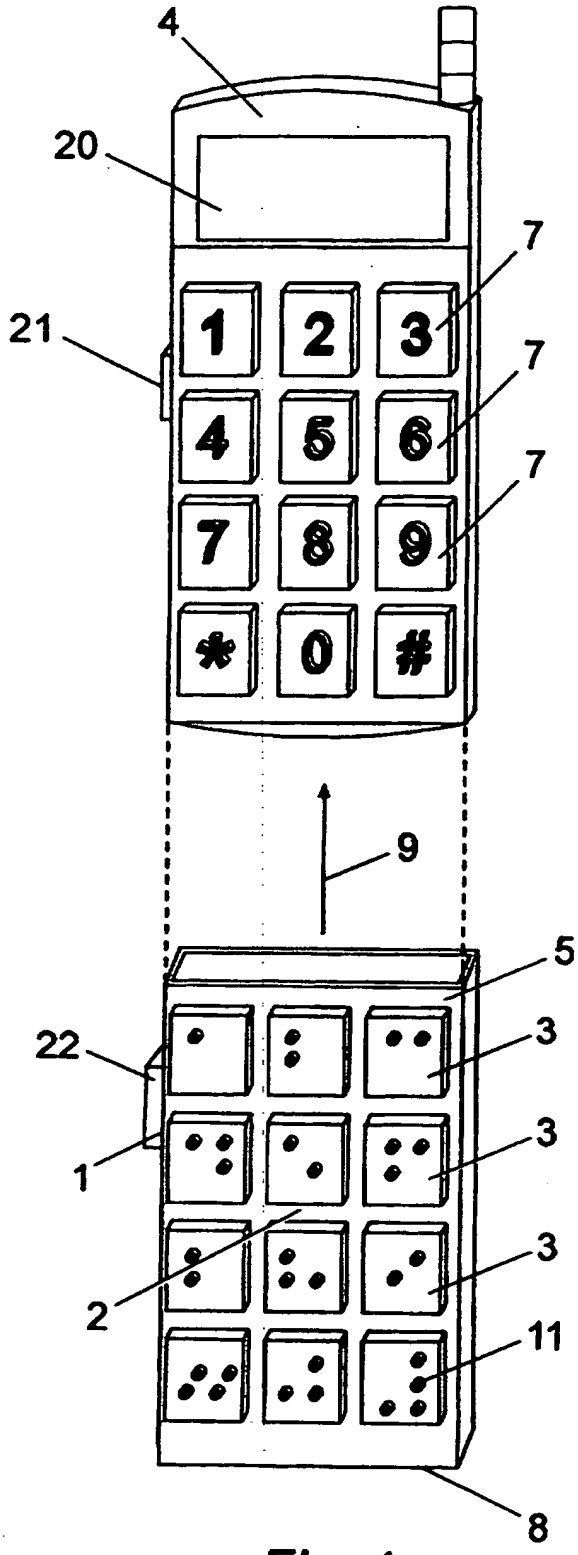

Fig. 1

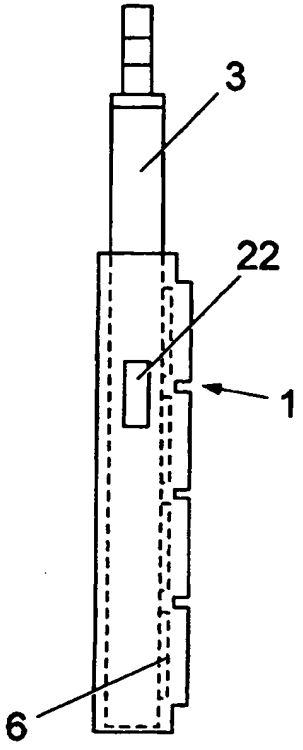

Fig. 1a

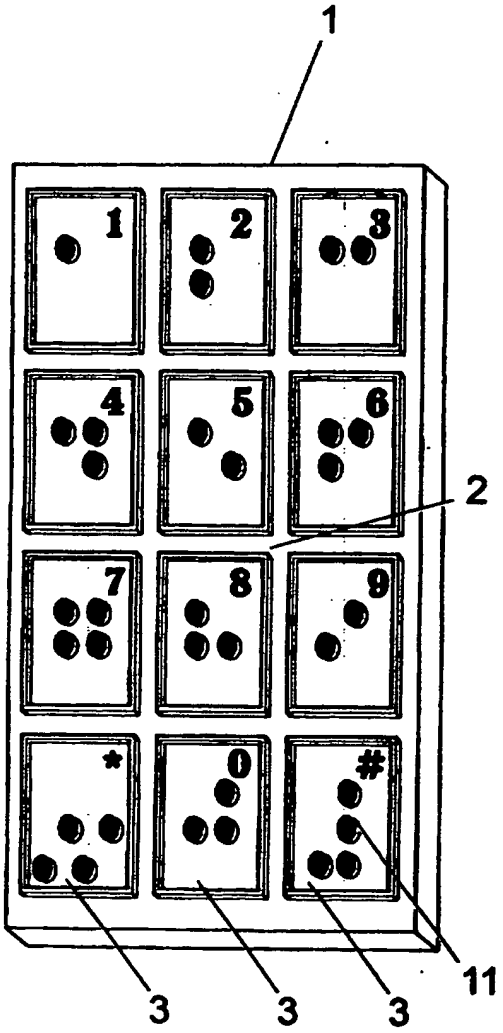

Fig. 2a

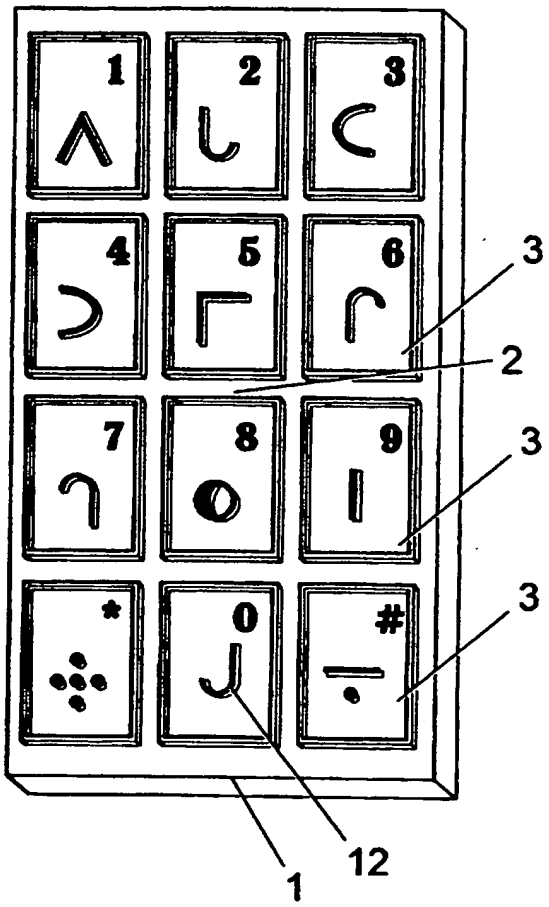

Fig. 2b

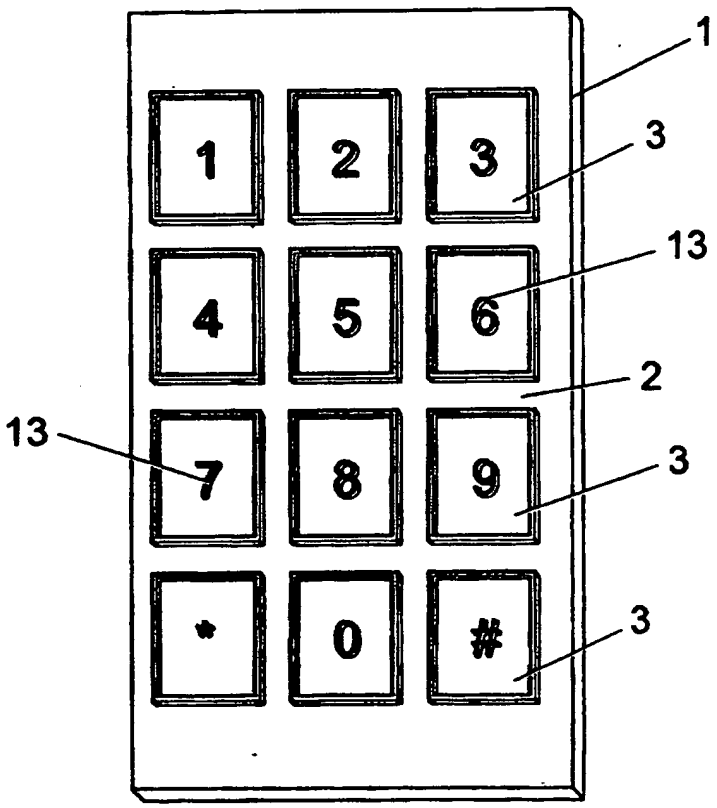

Fig. 2c